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Musculoskeletal Disorders in Nigeria Nursery Schools: Work-Related Risk Reduced

Imaekhai Lawrence
Department of Materials and Production Engineering , Ambrose Alli University, Ekpoma. Nigeria
+2348051804195. oboscos@yahoo.com

Abstract
This study investigated factors relevant to the risk of work-related musculoskeletal disorders among nursery staff employed by a local education authority. The aims of the study were to assess the WMSD risk factors present and level of reported prevalence of pain and discomfort, to find what determined exposure for individuals, and to identify feasible generic solutions. This included studies of three representative workplaces, a questionnaire survey of nursery staff and postural analysis of selected nursery activities. A high prevalence of reported back and neck trouble was found. Recommendations to reduce risk included improvements to work heights and seating, greater consideration of the organization of nursery activities, provision of sufficient space for activities and for storage of equipment, and reduction in manual handling.
Keywords: musculoskeletal disorder, nursery, education, posture, workplace.

1. Introduction

A number of studies have reported a high incidence of work-related musculoskeletal disorders, especially in the back, neck and shoulders, among staff working in child care nurseries (Crawford and Lane, 1998; Grant et al, 1995; Shimaoka et al; 1998). Some risk factors are obvious, particularly for those working with babies and toddlers who are more likely to need lifting and carrying than three and four year old children. Provision of child friendly furniture also results in excessive and frequent bending of furniture can be improved, which should be addressed in Nigeria where compatibility for both staff and children has been considered in new designs, but a wide scale change would be expensive in the short/medium term for existing nurseries. The present study investigated conditions in nurseries in a local authority area, with the aim of determining factors which affect exposure for individual staff and of identifying generic solutions which could reduce risk.

2. Methodology

The tasks performed by staff were investigated in three nursery units. These represented over 50 nursery units located within primary schools as well as separate nursery schools. Activity sampling was used to identify the wide variety of tasks performed in the units and posture analysis using OWAS (Karhu et al, 1977) was carried out for a range of reprehensive tasks.
A questionnaire was sent to approximately 200 nursery staff in over 50 schools in the local authority. The questions covered a range of physical, psychosocial and individual aspects of the work. The responses received (41%) from 34 teachers and 53 nursery nurses were analyses.

3. Results

Apart from one male teacher, the staff involved in the study were female. The majority worked 32.5 hours per week over five days during school terms. Only two respondents were over 55 years, indicating that most nursery staff have either retired or changed their job they reach their mid-fifties.

3.1 Prevalence of pain and discomfort

This was assessed using the Nordic Questionnaire (Kuorinka et al, 1987). This showed that 85% of staff had experienced low back trouble and 57% had experienced neck trouble during the previous year. There was also a high prevalence of reported trouble in shoulders (55%) knees (49%), hips (45%) and ankles (31%).
Statistical tests carried out on the questionnaire data showed that reported low back trouble was significantly associated with the lack of suitable work heights and furniture, high manual handling demands, and low levels of social support and decision authority. Reported neck trouble was significantly associated with frequency of lifting, perceived stress, age of staff and short stature. The length of time that staff had both back and neck trouble. Unexpectedly, those who were shorter in stature were also more likely to report low back trouble and neck trouble.

3.2 Work heights, seating and workplace layout

The presence of children's furniture was a significant problem. Children's chairs, desks and sinks were used frequently by the staff, even when they were not directly supervising the children (e.g when preparing work, completing reports/registers, during breaks).

Adult easy chairs were often used when reading / talking / singing with groups of children seated on the carpet, but these tended to be very low and soft with inadequate back rests, leading to a slumped posture.

During many activities, staff was frequently seen to be bending, stooping, kneeling and squatting in order to interact with the children. Some activities were more posturally demanding than others.

3.3 Manual handling

There was little routing lifting or carrying for the age group (3-5yrs) in these nurseries but it was required occasionally in particularly difficult circumstances, for example when a disruptive child had to be removed quickly from a group. Staff caring for children with special educational needs or challenging behaviour may be at grater risk of manual handling injuries.

It was also found that there were various heavy manual handling tasks required in moving (and storing) play and physical education equipment, and furniture. Equipment lends to be purchased with regard to play value for the children, child safety, durability, stability and cost. Less regard seems to be given to weight, storage requirements and maneuverability. Wooden equipment, for example, is often durable and stable, but can very heavy. The majority of staff had not received training manual handling.

3.4 Work organization

Work tasks were generally shared and rotated equally between different members of the nursery staff. However, the way that activities are rotated can lead to an uneven balance of daily postural demands. For example many nurseries operated a weekly rotation system in which each member of staff was responsibly for one main activity area. So one staff member might be responsible for creative or sand/water activities for a week, where the demands of bending and squatting are high, and another would be supervising outdoor play where the postural demands are much less (although manual handling demands may be greater).

The ways in which the activities were supervised also varied. Some activities were more structured than others, depending on how the staff choose to implement the 'desirable' outcomes' and on the personal style of interaction. Some staff made more effort to involve the children in 'housekeeping' duties such as washing up and clearing away-either by approaching the duties as play activities, or by rewarding helpful behavior, while others spent more time and energy in preparing and clearing away for the children. These different approaches also depended on the effect of layout and storage provision in the nursery. Larger nurseries may be able to store toys and materials in such a way that the children can help themselves. Nurseries with limited space may require the staff to tidy away activities on higher shelving.

3.5 Psychosocial factors

Most staff reported high levels of job satisfaction and social support. Nursery teachers reported higher levels of stress than nursery nurses but also higher levels of decision authority. In contrast, nursery nurses reported that they felt dissatisfaction at the fewer opportunities for progression and promotion.

4. Conclusions and Recommendations

Each nursery had its own advantages and disadvantages in terms of layout, facilities, storage and activity space. Staffing levels differed, as did individual approaches to educating and caring for the children. Equipment and furniture provision also varied. Therefore each nursery needs to be directly involved in establishing its own priorities to improve work conditions and reduce risks of work-related musculoskeletal disorders, based on the following recommendations.

4.1 Work heights and seating

Staff needs access to suitable and appropriately placed adult work surfaces (for use in both sitting and standing) and seating, for those times when they are not in direct contact with the children. This include break times and lunchtimes, staff/team meetings, administrative duties and activity preparation.

When purchasing new equipment, arrangements should be made with suppliers for 'trial periods' prior to purchasing. Further considerations are the weight of any furniture which needs to be moved and smooth/rounded edges so that the staff are at less risk of bruising their legs.

The feasibility of children using adjustable seating and work surfaces should be considered, as should the possibility of their using high stools or standing at an adult work-surface for some activities, through fitting trials or by using modeling techniques. Care is needed to ensure that children will be safe when using high stools.

4.2 Manual handling

Manual handling risk assessments should consider the range of activities in nurseries, and all staff should receive manual handling training. This should include the use of behavioral strategies to manage situations where the lifting of children becomes necessary.

Staff should consider their storage arrangements so that handling of equipment and materials can be kept to a minimum. This particularly applies to outdoor play equipment, and to the practice of moving heavy equipment and furniture outside in good weather. The involvement of children in fetching and putting away toys etc. should be encouraged as a normal part of nursery activities. Organization of activity rotations would allow handling and moving of equipment to be evenly distributed amongst the staff.

4.3 Work organization

Exposure levels to excessive postural demands could be reduced by altering the activity rotations in nurseries in order to improve the balance of activities over each working day. There should be a more even distribution of unsupported seated activities, creative/sand and water play (which is less posturally demanding).

The postures of both staff and children would benefit from engaging in daily ‘stretches’ as a group activity.

Work should be organized in such a way that staff are able to make use of break times and lunchtimes in order to regain either an upright erect posture or a supported posture in an adult seat.

Consideration needs to be given to meeting the employment needs of nursery staff as they become older and less able to mange the physical demands involved in nursery education.

4.4 Psychosocial factors

Action should be taken to address the effect of increased managerial demands and educational expectations on nursery staff, and to create working conditions which can enable staff to increase their levels of support for each other. This would aim to lessen the impact of the high levels of ‘stress’ perceived by nursery staff which was found to be linked to reported back and neck trouble.

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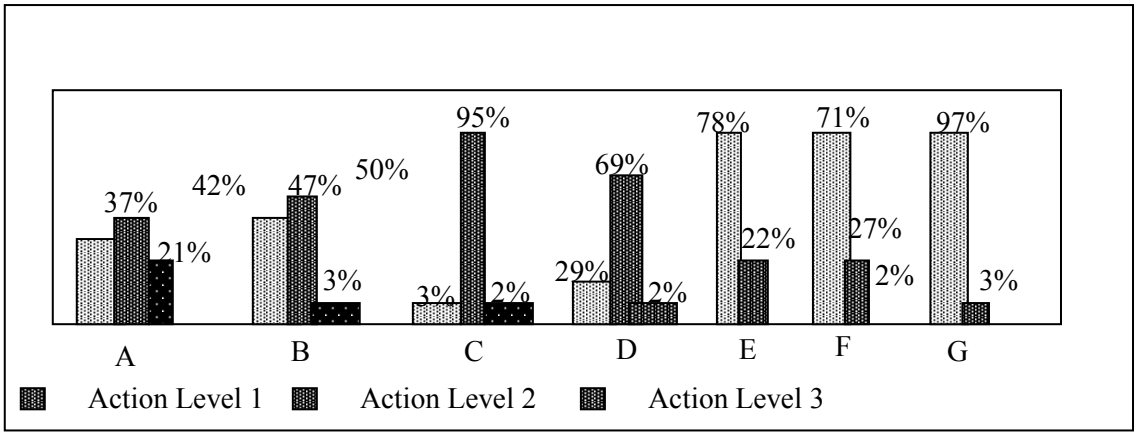

Figure 1. Percentage OWAS Action Levels for different nursery activities

OWAS Action Levels

Action level 1	No corrective measures
Action level 2	Corrective measures in the near future
Action level 3	Corrective measures as soon as possible

N.B. No Action Level 4s were recorded

Activities

A	Standing to supervise creative activities
B	Standing to supervise sand and water play
C	Sitting at child's table on child's chair
D	Sitting on low easy chair to read stories/sing songs
E	Playing football outside
F	Supervising general outdoor play
G	PE 'warm-ups'